CLINICAL MANAGEMENT OF VENOUS THROMBOSIS AND ITS COMPLICATIONS

Ms. Anitha KC* | Dr. Jacqueline Williams**

**Research. Scholar, Himalayan University, Itanagar, Arunachal Pradesh, India.*

***Research Supervisor, Himalayan University, Itanagar, Arunachal Pradesh, India.*

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ABSTRACT

Venous thrombosis refers to the formation of blood clots in the veins, most commonly occurring in the legs (deep vein thrombosis or DVT). The primary goal of clinical management is to prevent the clot from growing larger, prevent new clots from forming, and reduce the risk of complications, such as pulmonary embolism (when the clot travels to the lungs).

One of the main treatments for venous thrombosis is anticoagulant medication, also known as blood thinners. These medications help prevent the blood from clotting too easily and reduce the risk of further clot formation. Commonly used anticoagulants include heparin and warfarin. Heparin is usually administered intravenously or subcutaneously, while warfarin is taken orally. It's important to follow the prescribed dosage and duration as instructed by the healthcare provider.

In some cases, a more direct approach may be necessary to dissolve the clot. Thrombolytic therapy involves the administration of medications that can break down the clot. This approach is typically reserved for severe cases or when there is a high risk of complications. Another important aspect of managing venous thrombosis is the use of compression stockings. These specially designed stockings help improve blood flow in the legs and reduce the risk of swelling and pain. They work by applying pressure to the legs, assisting the veins in moving blood back towards the heart. In addition to medication and compression stockings, lifestyle modifications can also play a role in managing venous thrombosis. Regular physical activity, such as walking or leg exercises, can help improve blood circulation. It's also important to maintain a healthy weight and avoid prolonged periods of inactivity, such as sitting or standing for long periods without movement.

Key Words: *Thrombolytic therapy, managing venous thrombosis, compression stockings.*

ABOUT AUTHORS:

Author, Ms. Anitha KC is Research Scholar at Himalayan University, Itanagar, Arunachal Pradesh, India.

Author, Dr. Jacqueline Williams is Research Supervisor at Himalayan University, Itanagar, Arunachal Pradesh, India. She is active researcher with many publications in her name.

INTRODUCTION

Venous Thrombosis is a medical condition that occurs when a blood clot forms in a vein. The most prevalent type of venous thrombosis is deep vein thrombosis (DVT) which mostly occurs in the lower extremities of the body. When a blood clot forms within a vein blood flow is restricted and cannot flow in the normal way. This can result in pain swelling and tenderness in the affected area. After the occurrence of a DVT the most significant risk posed is the risk of a clot travelling to another area of the body in the blood (embolus). When an embolus lodges itself to a blood vessel this results in the interruption of the blood supply to an organ. When an embolus blocks blood flow to your lungs. This is called a pulmonary embolism.

Risk of the Development of Venous Thrombosis

The occurrence of a DVT can vary from individual to individual. A DVT is called unprovoked when there is no explanation for it occurring. If venous thrombosis can be attributed to the following reasons it is called provoked.

- Reduced flow in the vein,
- Damage to the wall of a blood vessels (vein),
- Increased "stickiness of the blood (Hughes syndrome),
- making clotting more probable,
- Increased age,
- Obesity,
- Immobility,
- Recent Surgeries / hospital admissions,
- Cancer,
- Pregnancy,
- Use of oral contraceptives,
- Long haul travelling,
- Smoking, and Metabolic syndrome.

Veins affected by Venous Thrombosis

Venous Thrombosis can affect any vein in the body. The most common type of venous thrombosis affects the deep veins in the leg which is known as DVT. Around 10 percent of DVTs affect the deep veins of the arm. Phlebitis / Superficial Vein Thrombosis (SVT) causes inflammation of a vein resulting in the formation of a blood clot. Patients with a (SVT) are at risk of the clot progressing into the deep veins (tobecome DVT) and potentially a PE. Venous thrombosis can also occur in veins where a medical cannula or line has been inserted.

Clinical Manifestations of Deep Vein Thrombosis in the Arm

DVT of the arm presents with the following symptoms. Cramping pain, swelling skin that looks bruised and warm to the touch. Its occurrence is most likely developed because of surgery or trauma to a vein.

Monitoring Diagnostic and Laboratory Procedures

A Clinician will carry out a detailed physical examination and medical history of the patient. To accurately diagnose and assess the extent of DVT and pulmonary embolism (PE). Regular monitoring of these diagnostic procedures and laboratory studies allows nurses to assess the effectiveness of treatment, monitor the patient's response, and identify any complications that may arise.

Computed Tomography Pulmonary Angiography (CTPA), D-Dimer Test, Ventilation- Perfusion (V/Q) Scan, Chest X-ray, Echo-cardiograph, Blood Gas Analysis, Electro-cardiogram (ECG), This non-invasive imaging test assesses the blood flow in the deep veins of the legs. It can help identify the presence of deep vein thrombosis (DVT), which often precedes pulmonary embolism.

Treatment and Management of Deep Vein thrombosis

Most patients with a DVT are treated with medications known as anticoagulants i.e. heparin. For patients with an obvious reason for their DVT (hospital admission/surgery blood thinning medication is recommended not exceeding a duration of three months. In addition to blood thinning medication the use of tight bandages or stockings on the leg with applied within 24hrs of the diagnosis and continued for 6-12 months is recommended to improve the pain and swelling in the leg. For many patients post DVT the leg remains painful and swollen. This is called post thrombotic syndrome. As a result, the leg can become severely discoloured and sores than remain difficult to heal (venous ulcers). Direct oral anticoagulants are recommended as first line treatment of a DVT/PE.

Risk of Developing Re Occurring DVTS

The risk of developing further blood clots depends on several factors. For example, if there was an apparent reason for it occurring such as surgery/hospital acquired Injury then the risk of further developing a cloth remains low. The risk however of Developing a further clot increases if there was no obvious cause (unprovoked DVT). Between a quarter and half of people with an unprovoked DVT will develop a further if blood thinning medication

is stopped.

A Deep Vein Thrombosis of the Upper and Lower extremities and its Management

Around one in ten of all DVTs occur directly because of the insertion of cannulas in the arm. Some people can also develop DVT in the arm after strenuous exercise, this is known as "effort thrombosis". If upper-extremity DVT occurs, it's less likely that one'll experience symptoms. These will typically include neck, arm or shoulder pain accompanied by swelling and weakness. The skin on arm may also change colours, similarly to DVT affects a leg vein. The management of a DVTs in the arm is effectively the same principles used in treating a DVTs in the leg. Similarly, it is recommended that people with DVT of the arm should be treated with blood thinning medications, aggressive clot removal or breakdown measures are not recommended.

Main Complications of DVT:

Pulmonary Embolism (PE) and its Management: PE is a common and potentially lethal condition. PE starts when a part of the thrombus breaks off and enters the pulmonary circulation and lodged in an artery in the lung and blocks blood flow to the lung (Ouellette & Mosenifar, 2020). In deep vein thrombosis (DVT), a thrombus develops within the deep veins, most commonly in the lower extremities. Pulmonary embolism is not a disease in and of itself. Rather, it is a complication of underlying venous thrombosis (Ouellette & Mosenifar, 2020).

Pathophysiology of the Occurrence of PE:

When a pulmonary artery is partially or completely obstructed, when a person breathing with an inadequate blood flow, causes impaired gas exchange. The release of substances from the clot and surrounding area causes constriction of blood vessels, which increases pulmonary vascular resistance. This raises pulmonary arterial pressure and can lead to right ventricular failure, decreased cardiac output, and shock. Atrial fibrillation can also contribute to PE by causing clot formation in the right atrium. Massive PE is characterized by hemodynamic instability, while multiple small emboli can result in lung infarctions.

Clinical Manifestation of Pulmonary Embolism - PE:

The clinical symptoms depend on the size and location of the embolus. The typical presentation of PE is the abrupt onset of pleuritic chest pain, shortness of breath, and hypoxia. However, most clients with PE have no obvious symptoms at presentation.

Types of Pulmonary Embolism:

When a pulmonary embolism is recognised, it is classified as

- Acute pulmonary embolism
- Chronic pulmonary embolism.
- Central pulmonary embolism.
- Peripheral pulmonary embolism.

Management of Pulmonary Embolism (PE):

Treatment approaches vary depending on the degree of cardiopulmonary compromise associated with PE. They can range from thrombolytic therapy in acute cases to anticoagulant therapy and general measures to optimize respiratory and vascular status (e.g., oxygen therapy and compression stockings).

Nursing Assessment:

Pulmonary embolism based on the nurse's clinical judgement and understanding of the patient's unique health condition. The symptoms of pulmonary embolism (PE) can vary depending on the size of the blood clot and the affected area of the pulmonary artery.

Nursing Goals

- To maintain adequate gas exchange, resolution or absence of symptoms of respiratory distress.
- To verbalise understanding of desired content: the importance of medications, signs of excessive anticoagulation, and means to reduce the risk for bleeding and recurrence of emboli and participate in the learning process.

Nursing Care Plans & Management:

Pulmonary embolism is a frequent hospital-acquired condition and one of hospitalized clients' most common causes of death. Therapeutic interventions and nursing actions for patients with diagnoses for pulmonary embolism: may include:

1. Minimizing Pulmonary Embolism Risk

Nurses play a vital role in preventing blood clot formation by promoting mobility, educating and motivating the importance exercises, emphasising the use of intermittent pneumatic compression (IPC) devices and proper fitting of inflatable sleeves to enhance leg blood flow. They also should avoid prolonged use of IV catheterisation, to reduce the risk of clot formation. These interventions, prevents venous stasis and lessen the risk of blood clots in patients.

- ❖ Provides important information about the patient's cardiovascular and respiratory status, allowing for early detection and prompt intervention in case of any deterioration. Regularly assess and monitor vital signs, this helps to detect any signs of hemodynamic instability or respiratory distress.
- ❖ Administer oxygen therapy, in order to maintain adequate oxygenation and alleviate respiratory distress, alleviates hypoxemia, and reduces the workload on the heart and lungs.
- ❖ Assist with thrombolytic therapy, in cases of severe pulmonary embolism to rapidly dissolve clots, promotes blood flow in the pulmonary arteries and improve pulmonary circulation, reducing the risk of further complications.
- ❖ Support anticoagulant therapy such as heparin or warfarin, is crucial in preventing the progression of pulmonary embolism and reducing the risk of future clot formation
- ❖ Promote and encourage early mobility and ambulation, which helps to prevent venous stasis, enhances blood flow, and reduces the risk of new clot formation and also helps in preventing complications associated with prolonged immobility.
- ❖ Educate on medication compliance and side effects, and the need for regular monitoring of blood parameters, and empowers patients to actively participate in their care and follow-up.
- ❖ Implement deep breathing and coughing exercises, to maintain effective gas exchange, thereby preventing respiratory complications such as atelectasis, pneumonia, COPD, etc.
- ❖ Pulmonary embolism can be a traumatic experience for patients and their families. Emotional support and reassurance help to alleviate anxiety, reduce stress, promotes a positive mind-set, and enhances overall well-being during the recovery process.

2. Managing Effective Gas Exchange & Oxygen Therapy

Heightened level of awareness among nursing professionals are paramount importance to identify possibility of PE in all patients and in minimizing the risk of pulmonary embolism (PE) and promoting effective gas exchange in the management of patients with reduced venous return.

- ❖ Assess the skin colour, nail beds, and mucous membranes for colour changes.
- ❖ Monitor for any changes in vital signs. In initial hypoxia and hypercapnia, there is an increase in the respiratory rate, heart rate, and blood pressure.
- ❖ Assess for the signs and symptoms of hypoxia such as confusion, headache, diaphoresis, restlessness, tachycardia, and pale skin.
- ❖ Auscultate lung sounds, noting areas of decreased ventilation, and the presence of adventitious sounds. Crackles are common clinical findings with pulmonary embolism.
- ❖ Assess for the signs and symptoms of pulmonary infarction, such as fever, cough, bronchial breathing, haemoptysis, pleuritic pain, pleural friction rub, and consolidation.
- ❖ Assess for calf tenderness, redness, swelling and hardened areas. Pulmonary embolism often arises from a deep vein thrombosis, after travelling to the lung, large thrombi can lodge at the bifurcation of the main pulmonary artery or the lobar branches and cause hemodynamic compromise (Ouellette & Mosenifar, 2020).
- ❖ Monitor for any changes in the ABGS.
- ❖ Monitor oxygen saturation as indicated.
- ❖ Assess the level of consciousness and evaluate mentation changes. (Vyas & Goyal, 2022).
- ❖ Assess activity intolerance, such as reports of weakness and fatigue, vital sign changes, or increased dyspnoea during exertion.
- ❖ Maintain the client on bed rest, to decrease the oxygen demand during an episode of acute respiratory distress.
- ❖ Position the client properly to facilitate ventilation-perfusion matching. Upright and sitting positions optimize diaphragmatic excursions and lung perfusion
- ❖ Maintain patent airways in order to maintain a patent airway such as deep breathing exercises, coughing, and suctioning
- ❖ Assist the client in dealing with fear and anxiety that may be present, with the inability to breathe and may actually increase oxygen consumption and demand.
- ❖ Monitor frequently and arrange for someone to be with the client, this provides reassurance along with brief explanations of what is happening.
- ❖ Ensure appropriate application of compression stockings, can limit post-phlebitic syndrome and have been proven effective in the prophylaxis of thromboembolism
- ❖ Prepare the client for a lung scan, to confirm the diagnosis of PE and degree of obstruction.
- ❖ Administer IV fluids or fluids by mouth as indicated, to reduce hyper viscosity of the blood, which can

potentiate thrombus formation.

- ❖ Administer oxygen as indicated, to decreases the work of breathing, relieves dyspnoea, and promotes comfort. The appropriate amount of oxygen needs to be continuously delivered so the client does not become desaturated.
- ❖ Anticipate the need to start anticoagulant therapy and, if there is massive thromboembolism, the use of thrombolytic therapy. Heparin or enoxaparin (Lovenox) is used to prevent the recurrence of emboli (Ouellette & Mosenifar, 2020).
- ❖ Assist with chest physiotherapy techniques, such as postural drainage and percussion of nonaffected areas, blow bottles, and incentive spirometry.
- ❖ Assist in surgical interventions as indicated, that is vena caval ligation or insertion of an intracaval umbrella may be useful for clients with recurrent emboli despite adequate anticoagulation. (Ouellette & Mosenifar, 2020).
- ❖ Discuss drug, herb, alcohol, and food interactions with the anticoagulants.

3. Maintaining Patent Airway Clearance and Effective Breathing Pattern

Nurses play a vital role in maintain patent airway clearance is essential to prevent the accumulation of secretions, optimize oxygenation, and minimize the risk of respiratory complications. In addition to airway clearance, promoting an effective breathing pattern is crucial for patients with pulmonary embolism.

CONCLUSION

In this literature, studied about DVT and its management, it is a condition that occurs when a blood clot forms in a deep vein in the body. Deep veins are the opposite of superficial veins, which are close to the surface of your skin. Lower extremities have deep veins, and DVT is extremely common in legs and if occurs seek for medical help immediately, if not treated, there is high risk of developing another potentially life-threatening condition called pulmonary embolism. If anyone spends a lot of time seated, motivate and educate the person, get up once an hour and walk around, one can also wear compression stockings, which apply pressure to the tissues in legs to help improve circulation and decrease chances of developing a clot.

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